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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/636,148
Filing Date: August 07, 2003
Appellant(s): BOHLING ET AL.

Kenneth Grimaldi
For Appellant

EXAMINER'S ANSWER

MAILED

NOV 15 2005

GROUP 1700

This is in response to the appeal brief filed 8-22-2005 appealing from the Office action
mailed 2-23-2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,486,313

MEITZNER ET AL.,

12-1984

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-6 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patnet 4,486,313 to Meitzner et al., (hereinafter "Meitzner").

The Patentee disclose making cross-linked polystyrene beads by copolymerizing styrene with divinylbenzene by aqueous suspension polymerization in the virtual absence of oxygen (col. 6 lines 27-34) to produce beads whose voids are of microscopic in size (col. 5 line et. seq. and col. 10 lines 59-69). While the amount of divinylbenzene (DVB) monomer employed in the preferred embodiments is higher than the claimed amount of DVB (col. 5 lines 20-30 and col. 7 line 56 et. seq.), the patentee expressly teaches in column 7, lines 56 et seq. that it is well known in the art that degree of crosslinking, which is governed by the amount of crosslinker, "has a profound effect n the physical properties of the product." Indeed, it is notoriously well known in the art that a wide variety of physical properties of a polymer will greatly depend degree of crosslinking. For example, in column 8, lines 11, et seq., the reference expressly discusses the effect of low degree of crosslinking on a polymer properties, such as high swelling in organic media and have lower oxidation resistance. While those properties may be undesirable for one application, it is clearly may have advantages for different applications. Therefore, lowering the amount of crosslinking agent to in the invention disclosed by Metzner to the amounts claimed by applicants, would have been clearly obvious for an ordinary artisan to achieve desired physical properties of a polymer depending of its end use since it is notoriously well known on the art that varying the amount of crosslinker "has a profound effect n the physical properties of the product."

The reference does not expressly address the claimed physical characteristics of the beads, however the reference expressly address creation of microchannels within the beads by adding a porogen or a precipitant as expressly discussed in column 4, line 61 to column 5, line 61 and column 10, lines 59-68. The reference further expressly discloses that it is well known in the art a=that all crosslinked polymers contain micropores, see column 5, lines 6-10. And further explicitly states that addition of the precipitant will results in creation of additional microchannels that will result in decrease of density and creation of reticular polymeric structure. While such a structure is a desired feature of the invention disclosed by Meitzner, elimination of an element along with its function would have been obvious for an ordinary artisan when this functions id not desired. The reference further expressly discloses that polymers obtained without the porogen exhibit higher density (see table II), thus providing additional motivation ot eliminate precipitants. Lowering DVB amount and eliminating the precipitant would inherently render the resulting beads, with the claimed physical characteristics as obtained by substantially the same process with substantially the same starting materials. The burden to show the differences in the claimed properties was shifted to the applicants, but no conclusive evidence to the contrary were ever presented on the record.

The invention as claimed, thus, would have been obvious for an ordinary artisan from the teaching of Meitzner.

(10) Response to Argument

The appellants argue that Meitzner "is directed to preparation of highly crosslinked beads, and teaches use of a minimum crosslinker level of 4 to 6%, with a maximum of 25% (Co1. 5, lines 20-3%. Meitzner fails to suggest, or even to mention any crosslinker level below 4%. Meitzner's general disclosure that varying crosslinking will result in a change in properties hardly amounts to a suggestion of the specific range "from 0.5 mole percent to 2 mole percent crosslinker," much less a suggestion even to vary properties in a direction that could result in Applicants' invention. Meitzner contains no guidance as to the optimum ranges of crosslinker that would achieve the beads claimed by Applicants; rather, the disclosure is, at most, an invitation to experiment with crosslinker level." See page 5 of the Brief.

The examiner acknowledged throughout the prosecution of the instant application that the Meitzner reference does not expressly disclose the claimed amount of the crosslinker, and, in fact, the preferred embodiments of Meitzner call for at least 4 % of crosslinker. However, as discussed in the rejection (and throughout the prosecution), lowering the amount of crosslinking agent, and, thus, lowering the degree of crosslinking in the resulting polymer is notoriously known in the art of polymer science. The same very reference employed by the Examiner in the rejection of the instant claims contains a long explicit discussion on the degree of crosslinking of a given polymer and how the degree of crosslinking "has a profound effect on the physical properties of the product." See Meitzner column 7, line 56 to column 8, line 34, for example. Even though that, arguendo, the object of the Meitzner's invention is a polymer with higher degree of crosslinking (or higher amount of crosslinker DVB

molecules) than instantly claimed amount of crosslinker, lowering the amount of crosslinker in the invention disclosed by Meitzner is not contrary to the teachings of Metzner, rather it is clearly within the capabilities and very basic skills of an ordinary polymer chemist in order to modify the final physical properties of the resulting polymer in a known and predictable way, absent showing of unexpected results that can be clearly attributed to the claimed degree of crosslinking. No such unexpected results are presented on the record.

The applicants further argue that Metzner contains no disclosure at all related to beads with no void spaces having a diameter greater than 5 um. The examiner agrees with this statement, however, as discussed above, Meitzner contains long and explicit discussion on the function of the precipitant or porogen which leads one of ordinary skill in the art to eliminate such for its effect and known physical properties changes. See, for example, discussions in columns 5 and 10. Moreover, the references expressly disclosed an example of the polymer obtained with no precipitant, which example exhibits significantly higher density or lower porosity. The applicants allege that Meitzner does not recognize the possibility of making polymer beads substantially free of micropores. This argument appears to be irrelevant to the claimed invention, since the claimed invention does not claim polymers free of voids, rather free of voids of certain size. Moreover, the polymers disclosed in Meitzner are obtained by conventional suspension polymerization technique in the absence of oxygen and with the only difference of using the precipitant. If obvious omitting the precipitant, as discussed above, (and lowering of DVB amount) from the process disclosed by the

reference will results in polymers with characteristics different from the claimed characteristics, the question is what essential steps of the process are not disclosed by the appellants?

Regarding the limitations to the particle size, and percent of extractables, the references, as mentioned by the applicants in (3) on page 6 of the Brief, does not suggest, or more particular, does not address those limitations. However, contrary to the applicants allegations that those limitations are not addressed in the final office action, those limitations were addressed in the first office action and the reasons for rejections stated in the first office action were incorporated in the final office action. Moreover, the original office action provided reasonable basis why the claimed limitations are inherently met by the product disclosed in Meitzner and shifted the burden to the applicants to provide clear evidence to the contrary. Contrary to the appellants allegation, it is the appellants who failed to meet their burden since no evidence or arguments to that point were ever provided in any of the responses to the office actions. Moreover, evidence provided in the declaration clearly support the fact that the overall size of the bead (or limitation designated by the appellants as (iii)) is clearly met by the product obtained by the process disclosed in Meitzner. See figures (photographs) 2-5 of the appellants declaration.

Applicants further argue that they have obtained unexpected results. The appellants state that the "Declaration of Dr. James C. Bohling, submitted with Applicants' response filed November 15, 2004, demonstrates that beads having 2% crosslinker and a precipitant, according to Meitzner's procedure, do not meet the void

space limitation of the present claims. Paragraph 7 of the Declaration summarizes the key points of the Figures therein. Figure 1 shows that beads made according to the present invention are completely free of visible void spaces. In contrast, Figures 2-5 show that beads prepared by the Meitzner method, but at low crosslinker levels, have numerous void spaces larger than 5 um. The central teaching of Meitzner is the use of precipitants, and there is no suggestion to use lower crosslinker levels or to omit the precipitant. Moreover, Meitzner does not recognize that it would be possible to prepare polymeric beads without micropores larger than 5 gm. Therefore, the improved properties of beads made according to the present invention could not have been predicted from Meitzner."

The examiner agrees that the comparative results presented in the declaration and shown on photographs 2-5 of the referenced declaration do not meet the pore size limitation of the instant claims. However, the results do not appear unexpected or to present the closest prior art comparison. First of all, all of the comparative results presented in the declaration are made with a large amount of solvent or precipitant, i.e., 35 %, while the reference expressly teaches that the amount of the precipitant can be much low as even exemplifies embodiments with as low as 20 %. See table II. Further, the reference expressly addresses the point throughout the disclosure that the role of the precipitant is to create microchannels and to increase the porosity and decrease the density of the resulting polymers. The reference further demonstrates that the polymer obtained without the precipitant exhibit higher density (and, by implication, lower porosity) as compared to any polymer of any degree of crosslinking obtained with any

amount of precipitant. See entire table II. This, in combination with expressed teachings of the effect of the precipitant on the structure of the resulting polymer, constitutes, if not an expressed teachings, at least clear indication and suggestion that removing precipitants will, in fact, result in lower pore size. Thus, the results demonstrated by the applicants are Not unexpected.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Irina S. Zemel



Conferees:

David Wu 

James Seidleck 